

REMARKS

Applicant respectfully requests entry of the foregoing amendments and reconsideration of the merits of the outstanding rejections in view of the following remarks. Claims 39-45, 47-58, and 60-73 are currently pending.

I. Request for Interview

In the event that there are any issues left unresolved by this Reply, the Examiner is respectfully requested to contact the undersigned to schedule a personal interview prior to issuance of another Office Action. Applicant believes that an in-person interview will greatly assist and expedite the examination of the present application. The undersigned can be reached at the number listed below.

II. Current Amendments to the Claims

Independent claims 39 and 51, and certain claims dependent therefrom, have been amended to better describe the claimed invention. Claims 68-73 are new claims. Applicant respectfully submits that the pending claims are fully supported by the specification and that no new matter has been added by way of these amendments. Exemplary support for independent claims 39 and 51 is noted below in detail.

III. Written Description Rejection

Claims 39-67 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. *See* Office Action at page 2. Particularly, the Examiner contends that certain limitations are not described in the specification. *See id.* Applicant respectfully disagrees and traverses this rejection on the grounds that the claims (as either originally filed or currently amended) are fully supported by Applicant's specification.

The following two tables illustrate the support for each respective step recited in independent claims 39 and 51 as currently amended. Applicant respectfully submits that the support for the dependent claims is readily apparent from a cursory inspection of the specification and need not be addressed here. Nonetheless, if the Examiner wishes to see exemplary support for the dependent claims, Applicant will provide the Examiner with such written support upon request. In view of the exemplary support noted below with respect to independent claims 39 and 51, the Examiner is respectfully requested to withdraw the instant written description rejection.

Recited Limitation in Claim 39	Exemplary Specification Support
<p>A method for performing knowledge discovery comprising the steps of:</p> <p>associating with each member of a data corpus one or more metatags through execution of a ranking function, wherein said ranking function is controllable through a parameter value;</p>	<p>[0019] “Both initial and retrospective metadata tagging are done at Level 1. Higher levels allow for different degrees of correlation among the data. When these correlations are done, it is possible to generate focused and pertinent retrospective metadata tagging directives. This is done partially through modifying the ranking function that guides metadata tagging.”</p> <p>[c1¹] “indexing and/or classifying the members of data corpus “A” by appending to each member one or more “metatags” descriptive of the content of that member”</p> <p>[c1] “where the only specific requirement of the classification algorithm(s) at least one of the algorithms(s) employed be ‘controllable’ through at least one parameter value”</p> <p>[c1] “the end result is the set of one or more “metatags” so produced by application of one or more classification algorithm(s) to a given data corpus element and then associated with that element are indicative of the content of each element”</p>
<p>selecting a first subset of members from said data corpus whose associated metatags are a match to a first set of criteria;</p>	<p>[0021] “Once the initial Level 1 pass is complete, the EF Feedback Loop and Utility Function allow the user to set the number and/or relevance scale to the first order of Level 2. The system will automatically push the most relevant sources to Level 2 so as to allow that portion of the system to apply its independent “noun phrase” parsing and “co-occurrence” algorithms to the classification/categorization process. The Level 2 processor will then push only its new classification/categorization concepts back to level 1 for re-indexing.”</p> <p>[c1] “Performing Level 1 to Level 2 Transition, by which a proper subset of members from the initial data corpus “A” are selected for Level 2 processing, which is done by selecting from among all the (optionally indexed and) metatagged</p>

¹ [c1] and the like refer to the respective claims (i.e., claim 1 and so on) as originally filed. See Applicant’s Specification at page 7 *et seq.*

Recited Limitation in Claim 39	Exemplary Specification Support
	members of data corpus "A" those whose metatags are a match to a set of criteria ... and this subset is denoted as data corpus "B"
processing said first subset of members to produce a set of pairwise associations between elements of each of said first subset of members;	[c1] "Performing Level 2 Pairwise Associative Processing, by which the data corpus "B" members elected during said step (b) are processed so as to produce "pairwise associations" between the elements of each of these members of "B"
selecting a subset of said set of pairwise associations that reach a certain predefined or present value;	[0021] "Once the initial Level 1 pass is complete, the EF Feedback Loop and Utility Function allow the user to set the number and/or relevance scale to the first order of Level 2. The system will automatically push the most relevant sources to Level 2 so as to allow that portion of the system to apply its independent "noun phrase" parsing and "co-occurrence" algorithms to the classification/categorization process. The Level 2 processor will then push only its new classification/categorization concepts back to level 1 for re-indexing." [c3] "where a typical embodiment of this method would be to use a cut-off process selecting only those "pairwise associations" that reach a certain predefined or preset value"
identifying a second subset of members from said data corpus based on said subset of said pairwise associations;	[c3] "where extracted subset of these associations is hereafter referred to as data corpus "C"
computing a utility function to measure a utility of said second subset of members;	[0006] "The purpose of the utility functions is to iteratively adjust the parameter controls sent back via the feedback loop process in order to maximize results according to a given benefit or utility." [0033] "The EF Utility functions are a set of measures of the value (utility) of an intermediate or final output to the end-user" [0033] "Utility functions thus provide a metric by which a proposed feedback action can be measured, and the overall performance of the system improved." [c6] "Performing Level N to Level (N-X) Feedback Control, where "N" [refers] to any of Levels 2 through 5, and "X" may take on any value from (1, ..., N-1) inclusive, by which one or more of the parameters governing any of the [lower level] processes ... are controlled by the feedback loop

Recited Limitation in Claim 39	Exemplary Specification Support
	<p>operating on the outputs computed at Level N”</p> <p>[c7] “Performing a Utility Function computation and output, by which the “Feedback Loop”... is modulated and controlled by a function so as to ... control and “tune” the feedback loop”</p>
<p>adjusting said parameter value to an adjusted parameter value based on said utility function;</p>	<p>[0019] “Both initial and retrospective metadata tagging are done at Level 1. Higher levels allow for different degrees of correlation among the data. When these correlations are done, it is possible to generate focused and pertinent retrospective metadata tagging directives. This is done partially through modifying the ranking function that guides metadata tagging.”</p> <p>[c6] “Performing Level N to Level (N-X) Feedback Control, where “N” [refers] to any of Levels 2 through 5, and “X” may take on any value from (1, ..., N-1) inclusive, by which one or more of the parameters governing any of the [lower level] processes ... are controlled by the feedback loop operating on the outputs computed at Level N”</p> <p>[c7] “Performing a Utility Function computation and output, by which the “Feedback Loop”... is modulated and controlled by a function so as to ... control and “tune” the feedback loop”</p>
<p>associating one or more members of said data corpus with one or more retrospective metatags through execution of said ranking function controlled by said adjusted parameter value; and</p>	<p>[0006] “The feedback loop is used in conjunction with one or more of the EF Utility Function(s). The purpose of the utility functions is to iteratively adjust the parameter controls sent back via the feedback</p> <p>[0019] “Both initial and retrospective metadata tagging are done at Level 1. Higher levels allow for different degrees of correlation among the data. When these correlations are done, it is possible to generate focused and pertinent retrospective metadata tagging directives. This is done partially through modifying the ranking function that guides metadata tagging.”</p> <p>[0020] “New concepts or classifications are passed back from Level 2 and to Level 1 for re-indexing and with results returned to Level 2.”</p> <p>[0021] “The Level 2 processor will then push only its new classification/categorization concepts back</p>

Recited Limitation in Claim 39	Exemplary Specification Support
	<p>to level 1 for re-indexing.”</p> <p>[c6] “Performing Level N to Level (N-X) Feedback Control, where “N” [refers] to any of Levels 2 through 5, and “X” may take on any value from (1, ..., N-1) inclusive, by which one or more of the parameters governing any of the [lower level] processes ... are controlled by the feedback loop operating on the outputs computed at Level N”</p> <p>[c7] “Performing a Utility Function computation and output, by which the “Feedback Loop”... is modulated and controlled by a function so as to ... control and “tune” the feedback loop”</p>
<p>selecting a third subset of members from said data corpus whose associated metatags are a match to a second set of criteria.</p>	<p>[0021] “Once the initial Level 1 pass is complete, the EF Feedback Loop and Utility Function allow the user to set the number and/or relevance scale to the first order of Level 2. The system will automatically push the most relevant sources to Level 2 so as to allow that portion of the system to apply its independent “noun phrase” parsing and “co-occurrence” algorithms to the classification/categorization process. The Level 2 processor will then push only its new classification/categorization concepts back to level 1 for re-indexing.”</p> <p>[c1] “Performing Level 1 to Level 2 Transition, by which a proper subset of members from the initial data corpus “A” are selected for Level 2 processing, which is done by selecting from among all the (optionally indexed and) metatagged members of data corpus “A” those whose metatags are a match to a set of criteria ... and this subset is denoted as data corpus “B””</p>

Now, turning to the particular steps of independent claim 51:

Recited Limitation in Claim 51	Exemplary Specification Support
<p>A method for performing knowledge discovery, the method comprising the steps of:</p> <p>determining a first degree of correlation among a data corpus;</p>	<p>[0019] “... first define a functional architecture in which different levels of knowledge representation and knowledge processing are used in a successive manner.”</p> <p>[0019] “Higher levels allow for different degrees of correlation among the data.”</p> <p>[0024] “Fig. 2 is exemplary schematic views of the</p>

Recited Limitation in Claim 51	Exemplary Specification Support
	<p>seven levels for a complete KD architecture includes five representation levels (1 through 5) and two control levels (6 and 7)”</p> <p>[0027] “The method and apparatus consists of a tiered set of representation levels, herein described as five representation levels ...”</p>
<p>metatagging members of said data corpus with metatags according to a metatagging scheme, wherein said metatagging scheme employs a first level of knowledge representation for said first degree of correlation and employs at least a second level of knowledge representation for a second degree of correlation among data, wherein said step of indexing is controllable through a parameter value, and wherein said first and second levels of knowledge representation are representative of different degrees of correlation among data;</p>	<p>[0019] “Both initial and retrospective metadata tagging are done at Level 1. Higher levels allow for different degrees of correlation among the data. When these correlations are done, it is possible to generate focused and pertinent retrospective metadata tagging directives. This is done partially through modifying the ranking function that guides metadata tagging.”</p> <p>[c1] “indexing and/or classifying the members of data corpus “A” by appending to each member one or more “metatags” descriptive of the content of that member”</p> <p>[c1] “where the only specific requirement of the classification algorithm(s) at least one of the algorithms(s) employed be ‘controllable’ through at least one parameter value”</p> <p>[c1] “the end result is the set of one or more “metatags” so produced by application of one or more classification algorithm(s) to a given data corpus element and then associated with that element are indicative of the content of each element”</p>
<p>determining said second degree of correlation among a first subset of said data corpus;</p>	<p>[c1] “Performing Level 2 Pairwise Associative Processing, by which the data corpus “B” members elected during said step (b) are processed so as to produce “pairwise associations” between the elements of each of these members of “B””</p>
<p>identifying a second subset of members from said data corpus based on said second degree of correlation among said first subset of said data corpus;</p>	<p>[c3] “where a typical embodiment of this method would be to use a cut-off process selecting only those “pairwise associations” that reach a certain predefined or preset value”</p> <p>[c3] “where extracted subset of these associations is hereafter referred to as data corpus “C””</p>
<p>computing a utility function to measure a utility of said second subset of members;</p>	<p>[0006] “The purpose of the utility functions is to iteratively adjust the parameter controls sent back via the feedback loop process in order to maximize results according to a given benefit or utility.”</p>

Recited Limitation in Claim 51	Exemplary Specification Support
	<p>[0033] "The EF Utility functions are a set of measures of the value (utility) of an intermediate or final output to the end-user"</p> <p>[0033] "Utility functions thus provide a metric by which a proposed feedback action can be measured, and the overall performance of the system improved."</p> <p>[c6] "Performing Level N to Level (N-X) Feedback Control, where "N" [refers] to any of Levels 2 through 5, and "X" may take on any value from (1, ..., N-1) inclusive, by which one or more of the parameters governing any of the [lower level] processes ... are controlled by the feedback loop operating on the outputs computed at Level N"</p> <p>[c7] "Performing a Utility Function computation and output, by which the "Feedback Loop"... is modulated and controlled by a function so as to ... control and "tune" the feedback loop"</p>
<p>adjusting said parameter value to an adjusted parameter value based on said utility function, and</p>	<p>[0019] "Both initial and retrospective metadata tagging are done at Level 1. Higher levels allow for different degrees of correlation among the data. When these correlations are done, it is possible to generate focused and pertinent retrospective metadata tagging directives. This is done partially through modifying the ranking function that guides metadata tagging."</p> <p>[c6] "Performing Level N to Level (N-X) Feedback Control, where "N" [refers] to any of Levels 2 through 5, and "X" may take on any value from (1, ..., N-1) inclusive, by which one or more of the parameters governing any of the [lower level] processes ... are controlled by the feedback loop operating on the outputs computed at Level N"</p> <p>[c7] "Performing a Utility Function computation and output, by which the "Feedback Loop"... is modulated and controlled by a function so as to ... control and "tune" the feedback loop"</p>
<p>remetatagging said members of said data corpus with metatags according to said metatagging scheme wherein said step of reindexing is controlled through said adjusted parameter value.</p>	<p>[0006] "The feedback loop is used in conjunction with one or more of the EF Utility Function(s). The purpose of the utility functions is to iteratively adjust the parameter controls sent back via the feedback</p>

Recited Limitation in Claim 51	Exemplary Specification Support
	<p>[0019] “Both initial and retrospective metadata tagging are done at Level 1. Higher levels allow for different degrees of correlation among the data. When these correlations are done, it is possible to generate focused and pertinent retrospective metadata tagging directives. This is done partially through modifying the ranking function that guides metadata tagging.”</p> <p>[c6] “Performing Level N to Level (N-X) Feedback Control, where “N” [refers] to any of Levels 2 through 5, and “X” may take on any value from (1, ..., N-1) inclusive, by which one or more of the parameters governing any of the [lower level] processes ... are controlled by the feedback loop operating on the outputs computed at Level N”</p> <p>[c7] “Performing a Utility Function computation and output, by which the “Feedback Loop”... is modulated and controlled by a function so as to ... control and “tune” the feedback loop”</p>

IV. The Anticipation Rejection of Claims 39-67

Claims 39-67 stand rejected under 35 U.S.C. § 102(e), as being allegedly anticipated by United States Patent No. 6,678,694 to Zimmerman *et al.* (“Zimmerman”). See Office Action at page 3. Particularly, the Examiner contends that Zimmerman discloses each and every step in method claims 39-67. See *id.* Applicant respectfully disagrees and traverses this rejection on the following grounds.

As stated in MPEP § 2131, “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

A. **The Claimed Invention Addresses The Shortcomings of Prior Art Like Zimmerman As Noted In Applicant’s Specification**

Prior to addressing the specific limitations of the claims in detail, Applicant believes that a discussion regarding the general nature of the prior art vis-à-vis the claimed invention is necessary. The general nature of the prior art was addressed in Applicant’s specification, but is

conveyed again here to point out the shortcomings of prior art and certain distinctions between Applicant's claimed invention and Zimmerman.

The prior art as exemplified by Google's process places a user (e.g., a person initiating a search) as the primary evaluator of search results. *See, e.g., Applicants specification at ¶ 14:*

Like most others, Drs. Brin and Page place the user as the initial and primary element(s) of the feedback loop. There, the "user may optionally evaluate all of the results that are returned." But it is precisely this positioning that becomes untenable as very large corpora are considered. This "Google" process, common among most COTS tagging and search products, has clearly achieved less than satisfactory results in the challenging intelligence data-parsing environment. Even user-oriented search training functions ultimately only serve to constrain results based on the limitation of a particular tool's mathematical capabilities.

Here, the Applicant is emphasizing that control in prior art knowledge discovery systems is based primarily on user evaluation, which does not achieve satisfactory results.

Zimmerman is another example of a user evaluation prior art system. Zimmerman describes an interactive document retrieval system that implements the five following basic steps:

1) indexing documents presented to the retrieval system (*see, e.g., Zimmerman at col. 4:59 to col. 5:13*);

2) running a search query (i.e., a basic keyword search) received from a requestor to capture a set of indexed documents (*see, e.g., id. at col. 3:21-24, col. 9:23-28, col. 10:51-56, and col. 11:39-59*);

3) analyzing the captured documents to determine word patterns (e.g., word pairs) to assign one or more topics to each captured document (*see, e.g., id. col. 3:24-32, col. 8:18-38, and col. 11:60 to col. 12:9*);

4) assigning a list of topics to the captured documents and presenting this to the requestor who then designates at least one topic that is relevant to the requestor's search (*see, e.g., id. col. 3:32-36 and col. 11:4-38*); and

5) granting the requestor access to the subset of captured documents to which topics designated by the requestor have been assigned (*see, e.g., id. at col. 3:36-39*).

In sum, Zimmerman merely permits a user to narrow the results of the original search by topic(s). Zimmerman does not reindex the documents available to the system (i.e., execute the

first step noted above for a second time) nor rerun the original search (i.e., execute the second step noted above for a second time) after the user selects the topic(s).

The claimed invention, however, reruns lower level knowledge discovery processes (such as searches) based on feedback provided by higher level knowledge discovery processes. Feedback is accomplished through a feedback loop used in conjunction with one or more utility functions. *See, e.g.*, Applicant's specification at ¶ 6:

The distinguishing feature of the methodology is the use of the "EF Feedback Loop", a process that incorporates the highest and best use of multiple COTS tools.

* * * *

The feedback loop is used in conjunction with one or more of the EF Utility Function(s). The purpose of the utility functions is to iteratively adjust the parameter controls sent back via the feedback loop process in order to maximize results according to a given benefit or utility.

Here, the Applicant is referring to the notion of controlling a knowledge discovery process based on feedback provided by a higher level knowledge discovery process. For example, in one embodiment of the invention, the following methodology is performed:

1) executing an indexing/classification (referred to as "Level 1") algorithm, which is controllable through at least one parameter value, to associate one or more "metatags" descriptive of content to each member of data corpus "A" (*see id.* at [c1]);

2) selecting a subset "B" of the data corpus "A" for higher level processing, such as pairwise associative processing (referred to as "Level 2") (*see id.*);

3) performing pairwise associative processing among the members of data corpus "B" (*See id.*);

4) selecting a subset "C" from the data corpus "B" based on filtering the pairwise associations found in step 3) (*see id.* at [c3]);

5) computing a utility function (i.e., a value measuring utility) of subset "C" (*see id.* at [c7]);

6) adjusting the parameter value of the indexing/classification algorithm in response to the computed utility function via a feedback loop (*see id.* at [c6] and [c7]);

7) re-executing the indexing/classification algorithm using the adjusted parameter value to each member of the original data corpus "A" (*see id.* at ¶¶ 6, 19, and 21, and [c1]); and

8) selecting a subset "D" of the data corpus "A." (*see id.*).

Independent claim 39 is essentially directed to the above eight steps. Clearly, Zimmerman fails to disclose at least the latter four steps, i.e., step nos. 5-8. Independent claim 51 is a more generic version of claim 39, where the first level of knowledge discovery processing can be any level of knowledge discovery processing (e.g., Levels 1-4) as long as it is lower than the second level of knowledge discovery processing (e.g., Levels 2-5, respectively).

Now turning to the specific steps recited in independent claims 39 and 51:

B. Zimmerman fails to disclose the step of “computing a utility function to measure a utility of said second subset of members”

Zimmerman fails to disclose the step of “computing a utility function to measure a utility of said second subset of members” as recited in independent claim 39 and similarly recited in independent claim 51. As noted in Applicant’s specification, a utility function is a measure of the value (utility) of an intermediate or final output to the end-user. *See id.* at ¶ 6.

Zimmerman merely allows a user to select one or more identified topics associated with captured documents. *See, e.g.*, Zimmerman at col. 3:32-36 and col. 11:4-38. Zimmerman is not computing the utility of any subset of documents, e.g., the documents associated with selected topics.

C. Zimmerman fails to disclose the steps of “adjusting said parameter value to an adjusted parameter value based on said utility function” and “associating one or more members of said data corpus with one or more retrospective metatags through execution of said ranking function controlled by said adjusted parameter value”

Zimmerman fails to disclose the steps of “adjusting said parameter value to an adjusted parameter value based on said utility function” and “associating one or more members of said data corpus with one or more retrospective metatags through execution of said ranking function controlled by said adjusted parameter value” as recited in independent claim 39 and similarly recited in independent claim 51. Adjusting the parameter value allows feedback control over a lower level knowledge discovery process (e.g., a Level 1 indexing step). *See id.* at ¶¶ 6, 12, 19, and 21. Zimmerman does not address whatsoever the step of reindexing (i.e., the first step noted above) documents.

D. Zimmerman fails to disclose the step of “selecting a third subset of members from said data corpus whose associated metatags are a match to a second set of criteria”

Zimmerman fails to disclose the step of “selecting a third subset of members from said data corpus whose associated metatags are a match to a second set of criteria” as recited in independent claim 39 and similarly recited in independent claim 51. Zimmerman does not address whatsoever re-running the original search (i.e., the second step noted above) after the user selects the topic(s)

For at the reasons noted above, Zimmerman fails to disclose each and every element of independent claims 39 and 51. Claims 46 and 59 have been cancelled. Claims 40-45, 47-50, 52-58, and 60-73 are not anticipated by Zimmerman at least because they depend from one of claims 39 and 51. The Examiner is respectfully requested to withdraw the anticipation rejection of claims 39-67.

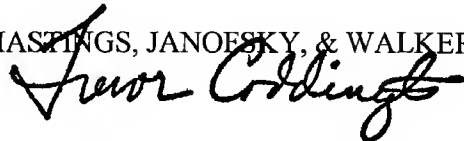
V. Conclusion

In view of the foregoing, it is respectfully submitted that the present application is in condition for allowance, and an early indication of the same is courteously solicited. The Examiner is respectfully requested to contact the undersigned by telephone at the below listed telephone number, in order to expedite resolution of any issues and to expedite passage of the present application to issue, if any comments, questions, or suggestions arise in connection with the present application.

Applicant is concurrently submitting herewith the requisite fee for the excess dependent claim(s). In the event that the U.S. Patent and Trademark Office requires additional fees to enter and/or consider this Reply, or to prevent abandonment of the present application, please charge such fees to the undersigned's Deposit Account No. 50-2613.

Respectfully submitted,

PAUL, HASTINGS, JANOFESKY, & WALKER LLP



Dated:

By: _____

Trevor Q. Coddington, Ph.D., Esq.
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U.S. APPLICATION NO. 10/604,705
AMENDMENT AND RESPONSE DATED JUNE 7, 2007
AMENDMENT AND RESPONSE TO NON-FINAL OFFICE ACTION OF MARCH 7, 2007

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